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APR 12 2007

Docket No.: KKP-0276
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Takashi Ohno

Application No.: 10/806,267

Confirmation No.: 1916

Filed: March 23, 2004

Art Unit: 1714

For: WATER BASED INK FOR BALL-POINT PEN
AND BALL-POINT PEN USING THE SAME

Examiner: Callie E. Shosho

DECLARATION UNDER 37 C.F.R. § 1.132Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Takashi Ohno, the inventor of the above identified Application, being duly warned, hereby declare and say that:

1. I am the inventor of the subject matter claimed in the above-captioned U.S. Patent Application ("the Application");

2. I am familiar with the technology involved in U.S. Patent No. 6,916,862 to Ota et al., U.S. Publication No. 2005/0096410 to Hattori et al., U.S. Patent No. 6,114,412 to Kanbayashi et al., U.S. Patent No. 5,678,942 to Kobayashi et al., British Application No. GB 2131445, U.S. Patent No. 4,338,133 to Toyoda et al., U.S. Patent No. 5,268,347 to Okumura et al., and U.S. Patent No. 6,160,034 to Allison et al.;

3. The invention claimed in the above-captioned application relates to a ball-point pen which uses a water based ink having a novel function, and more particularly, to a ball-point pen

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which uses a water based ink capable of writing on a non-permeable surface such as metal, glass or plastics; and

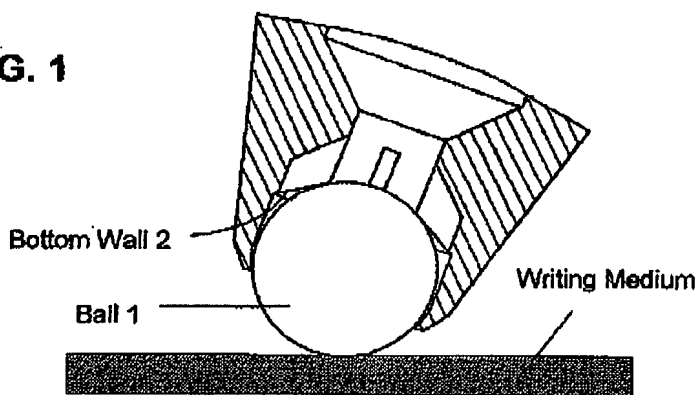
4. I have reviewed the Office Action(s) in the application, and the prior art cited therein. To respond to the outstanding Office Action, I conducted the following experimentation.

EXPERIMENTATION

1. Aqueous ink for ball point pen of Examples 1, 3, 5 and 6 of the Application was filled into each of ball point pens (MULTI-BALL, trade name of ball point pens manufactured by Kabushiki Kaisha Pilot Corporation) having either Ball A, which is 5 nm or lower in surface roughness, or Ball B, which is larger than 5 nm in surface roughness, for the purposes of comparative experiments. The results are shown in Table 1 and Table 2. The tip end structure of the ball point pen is shown in FIG. 1. The writing characteristics are shown in FIG. 2A through FIG. 2C.

2. If ball surface roughness is large, contact resistance between the ball 1 and the bottom wall 2 is large, and thus ball rotation is not smooth during writing on a non-permeable surface, such as a glass surface, and writing characteristics become blocky. By making ball surface roughness small (5 nm or less), the contact resistance of the ball 1 against the bottom wall 2 becomes small, and desirable writing characteristics can be obtained.

FIG. 1



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3. Writing Resistance Test

A Surface Property Tester was used to measure resistance value between a ball and a bottom wall when writing onto a paper surface. The Surface Property Tester machine is HEIDON-14, manufactured by Shinto Scientific Co., Ltd. (See detailed explanation available at website of <http://www.heidon.co.jp/home.htm>).

- Writing medium: Writing paper (A: JIS P3201)
- Load Weight: 100 gf
- Writing Angle: 70 degree
- Writing Speed: 4m/min.
- Ball Diameter: 0.5 mm
- Surface roughness: Ball A: 4.0 nm; Ball B: 8.6 nm.

4. Writing Characteristics Test

Writing characteristics on a non-permeable surface were observed and quality of writing was judged.

- ◎ Writing does not have contrasting density and thus satisfactory as shown in Fig. 2A.
- Writing provides contrasting density as shown in Fig. 2B.
- × Writing is not continuous and exhibits non-written portions as shown in Fig. 2C.

- Writing medium: Glass surface
- Load Weight: 100 gf
- Writing Angle: 70 degree
- Writing Speed: 4m/min.
- Ball Diameter: 0.5 mm
- Surface roughness: Ball A: 4.0 nm; Ball B: 8.6 nm.

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Writing with no contrasting density: ⊙

FIG. 2A



Writing with contrasting density: ○

FIG. 2B



Writing with non-written portion: x

FIG. 2C

Table 1

	Example 1 Ball A	Example 1 Ball B	Example 3 Ball A	Example 3 Ball B
Writing Resistance (gf)	37.1	42.8	37.1	42.8
Writing Quality	⊙	⊙	⊙	○

Table 2

	Example 5 Ball A	Example 5 Ball B	Example 6 Ball A	Example 6 Ball B
Writing Resistance (gf)	38.4	43.8	36.5	42.2
Writing Quality	⊙	○	⊙	⊙

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EVALUATION AND CONCLUSIVE DECLARATION

I declare that the Experimental Data above provides strong evidence that the invention of the present Application, a ball point filled with an aqueous ink of the Application, having a ball which is 5 nm or lower in surface roughness, shows unexpected and superior results in terms of writing resistance on a paper surface, and writing characteristics and quality of writing on a nonpermeable surface, in comparison with a similar pen having a ball with a surface roughness greater than 5 nm.

FINAL STATEMENT

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent resulting therefrom.

April 11, 2007

Date

Takashi Ohno

Takashi Ohno